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EXAMINER	
COUGHLAN, PETER D	

ART UNIT	PAPER NUMBER
2122	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/562,008	BUENDIA ET AL.	
	Examiner	Art Unit	
	PETER COUGHLAN	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-42* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-7,11-17,19-21,23,24,26-30 and 32-38* is/are rejected.

8)☒ Claim(s) *8-10,18,22,25,31 and 39-42* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/11/201*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. The examiner acknowledges the applicant's amendment filed August 5, 2011. At this point claims 1-42 are pending in the instant application and ready for examination by the examiner.

Allowable Subject Matter

2. Claims 8-10, 18, 22, 25, 31, 39-42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

If the applicant should choose to rewrite the independent claims to include the limitations recited in either of claims 8-10, 18, 22, 25, 31, 39-42, the applicant is encouraged to amend the **title of the invention** such that it is descriptive of the invention as claimed as required by sec. **606.01** of the **MPEP**. Furthermore, the **Summary of the Invention** and the **Abstract** should be amended to bring them into harmony with the allowed claims as required by paragraph 2 of **sec. 1302.01** of the **MPEP**.

Claim Rejections - 35 USC §102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7, 1 1, 12, 14, 15, 17, 1 9-21, 23, 24,26-30, 32-38 are rejected under 35 U.S.C. 102(a) (hereinafter referred to as **Stephens**) being anticipated by Stephens, 'Modelling Fish Behaviour.'

Claim 1

Stephens discloses an automatic method for decision-making by (**Stephens,** p71 c1; Decision making of applicant maps to decision tree of Stephens.) a virtual or physical agent (**Stephens,** abstract; virtual agent of applicant maps to artificial fish of Stephens.) according to external variables coming from an environment described by a numerical model stored in memory means of the agent or by physical sensors (**Stephens,** abstract; External variables coming from an environment of applicant maps to sensory input from the environment of Stephens.) connected to said agent, variables internal to the agent described by numerical parameters (**Stephens,** p73 c1; Internal to the agent of applicant maps to fish motivation of Stephens. Numerical parameters of applicant maps to the example of time between meals of Stephens. Parameters of

applicant maps to parameters of Stephens.) stored in the memory means of the agent, and processing means of the agent called decision-making means controlling actuators of said agent (**Stephens,** p71 c1; Decision making controls the agent of applicant maps to decision tree based action selection mechanism of Stephens.), characterised in that said decision-making means determines the parameters of at least one action of said agent (**Stephens,** p73 c1; 'Decision-making means determines the parameters of at least one action of said agent' of applicant maps to the example of hunting of Stephens. If the predator becomes hungry, then it chooses the parameter to 'hunt.'), according to at least some of the internal or external variables, the operation of determining the parameters of an action being carried out by subprocessing means, called interest centre, which performs several decision subprocesses each subprocess consisting in calling a processing block which performs a function of at least some of said external and internal variables (**Stephens,** p73 c1, fig 3; Several decision subprocesses of applicant maps to fish's energy level, appetite, digestion rate of Stephens. Centre of applicant maps to 'behavioural selection' of Stephens), and each actuator dealing with a limited part of the general decision problems, the parameters determined by each of said subprocesses being processed in order to construct the set of action parameters controlling said agent. (**Stephens,** p73 c1; 'Subprocesses being processed in order to construct the set of action parameters controlling said agent' of applicant maps to fish's energy level, appetite, digestion rate of Stephens. This in turn affects the 'hunger' model which is part of the motivation. Controlling the agent of applicant maps to function of motivation of Stephens.)

Claim 2

Stephens discloses characterised in that some internal variables are numerical values representing perception. **(Stephens,** p74 cl ; Perception of applicant maps to the function of the perception module. 'Numerical values' which are part of perception of applicant is inherent to a module which is part of an artificial fish of Stephens.)

Claim 3

Stephens discloses characterised in that some internal variables are numerical values representing motivation. **(Stephens,** p73 cl ; Motivation of applicant maps to motivation of Stephens. 'Numerical values' which are part of motivation of applicant is inherent to a model which is part of an artificial fish of Stephens.

Claim 4

Stephens discloses characterised in that some external variables are numerical values representing opportunity. **(Stephens,** p72 c2; External variables are numerical values representing opportunity of applicant maps to fish will choose to join the larger of two schools when given the opportunity of Stephens.)

Claim 5

Stephens discloses characterised in that calculation of the parameters, motivations and opportunities is performed by a tree of processing blocks, each

processing block corresponding to a function receiving input variables comprising some of the internal variables, and external variables and output variables of one or more upstream processing blocks. **(Stephens,** p71 cl and figure 3; Tree of processing blocks of applicant maps to decision tree of applicant. External variables of applicant maps to environment of Stephens. Motivation and opportunity processing blocks of applicant maps to the perception and motivation processing blocks of Stephens. Internal variables of applicant maps to the computation within each block and exchanging outputs of the blocks within the autonomous fish of Stephens.)

Claim 6

Stephens discloses characterised in that said processing blocks comprise logical operators, expert systems and mathematical operators. **(Stephens,** p75, c2, p76 c2; Logical operators of applicant maps to '<' of Stephens. Mathematical operators of applicant maps to '+' of Stephens. Expert systems of applicant maps to chaining which is disclosed in state machine models of Stephens.)

Claim 7

Stephens discloses characterised in that it comprises a means of interrupting said parameter-determining operation consisting of controlling the action of the agent with the parameters determined using the subprocesses processed before the interruption. **(Stephens,** abstract; Interrupting parameter determining operation of applicant maps to the current environment input of Stephens. If a change in the

environment which determines a change within the agent, then this change occurs with the behavioural rules of Stephens.)

Claim 11

Stephens discloses characterised in that said interruption means is controlled by a function of the master system. **(Stephens,** figures 8a-b; Master system of applicant maps to shark state machine or fish state machine of Stephens. interruption with the shark is determined by 'Is Full, -Is Full, Is Hungry, -1sHungry' of Stephens. interruption with the fish is determined by 'Is Scared, -IsScared9 of Stephens.)

Claim 12

Stephens discloses characterised in that it comprises steps for interrogating the master system after each determination of a parameter set for an action, and for activating said interruption means according to the response of the master system to this interrogation. **(Stephens,** figures 8a-b, p73, cl ; Parameter set for an action of applicant maps to a fish energy level, appetite and digestion rate of Stephens. Activating said interruption means according to the response of the master system to this interrogation of applicant maps to by altering these parameters a predator fish can be made to appear greedy by constantly being on the hunt for large amounts of food of Stephens.)

Claim 14

Stephens discloses characterised in that it comprises means of recording the state of the calculation trees, actuators and subprocesses at the time of the interruption, and means for continuing the decision process using the recorded information. **(Stephens,** p76 figures 8a-b; 'Recording the state of the calculation trees, actuators and subprocesses at the time of the interruption' of applicant is inherent to Stephens due to the state machines would not function is a previous state was not recorded. 'Continuing the decision process using the recorded information' of applicant is inherent to the state machines of Stephens. If a shark is in 'hunt' mode and enough prey is eaten, then the interruption occurs and 'IsFull' takes place. The 'continuation of the decision process' of applicant maps to the state matching leading to 'wander' of Stephens.)

Claim 15

Stephens discloses characterised in that several agents are controlled from a common decision model, said decision model comprising a means of recording the information specific to each agent. **(Stephens,** p72, c2; 'Characterised in that several agents are controlled from a common decision model' of applicant maps to 'When seeing a predator schooling fish will decrease their distance from each other and their movements become more synchronised' of Stephens.)

Claim 17

Stephens discloses characterised in that it comprises means of processing

logical dependencies between the subprocesses. **(Stephens,** p73 cl ; Several decision subprocesses of applicant maps to fish's energy level, appetite, digestion rate of Stephens. These are all logical dependencies of motivation of Stephens.), and

Claim 19

Stephens discloses characterised in that it carries out the processing of multivalued external variables originating from different perceived objects of the environment. **(Stephens,** p75, cl ; Examples of multi-valued external variables originating from different perceived objects of the environment of applicant maps to perception, vision, collision detection of Stephens.)

Claim 20

Stephens discloses characterised in that the output values of a processing block are memorised during the processing cycle if they are used by another subprocess. **(Stephens,** p76 figures 8a-b; 'Memorised' of applicant equates to recording the state of applicant on a smaller domain. It is inherent that the output values are 'memorised' due to the state machines would not function without these values being recorded till changed of Stephens.)

Claim 21

Stephens discloses characterised in that said output values are recorded in a memory common to several processing blocks. **(Stephens,** p76 figures 8a-b; 'Output

values are recorded' of applicant is inherent to Stephens due to the state machines would not function is a previous state was not recorded.)

Claim 23

Stephens discloses characterised in that it comprises a means of implementing a behavioural detail level. **(Stephens,** ; 'Behavioural detail level' is only mentioned in 70027 and not described at all within the specification. 'Behavioural detail level' of applicant maps to the details of 'hunger' which lead to energy level, appetite and digestion rate of Stephens.)

Claim 24

Stephens discloses characterised in that it comprises a convergent adaptation mechanism irrespective of the nature of the learning signal. **(Stephens,** p78 cl ; 'Adaptation mechanism irrespective of the nature of the learning signal' of applicant maps to 'locomotion training so the animal can learn the most efficient way to move' of Stephens.)

Claim 26

Stephens discloses characterised in that it comprises means of grouping and recording memories consisting of information corresponding to perceptions or to calculation tree results. **(Stephens,** p73, cl ; Grouping of applicant maps to the different

attributes of hunger of Stephen. Recording memories of applicant maps to the current values on energy level, appetite, and digestion rate of Stephen.)

Claim 27

Stephens discloses characterised in that it comprises a step of grouping memories in the form of strata. **(Stephens,** p73, figure **3;** In the form of a strata of applicant maps to the strata design of the fish architecture of Stephen.)

Claim 28.

Stephens discloses characterised in that it comprises a recognition step consisting of selecting the active memories. **(Stephens,** p73, cl ; Active memories of applicant maps to the current values on energy level, appetite, and digestion rate of Stephen.)

Claim 29

Stephens discloses characterised in that it comprises an operation of creating a new memory in the case of absence of perfect recognition. **(Stephens,** p75, cl ; In the case of absent of perfect recognition of applicant can be viewed as a function of optimisation of applicant maps to 'This method has a complexity O(n) but can be optimized through the use of localization techniques of Stephens. 'Influences' of applicant maps to 'vision' of Stephens.)

Claim 30

Stephens discloses characterised in that it comprises an operation of updating the active memories by replacing the memorised information by the state of the calculated information. **(Stephens,** p76 figures 8a-b; 'updating the active memories by replacing the memorised information by the state of the calculated information' of applicant is inherent to the machine state to operate. For example in figure 8a, if the shark is in the state 'hunt' it will remain there till -1sFull is reached. Then the shark 'updates' its status with 'wander' of Stephens.)

Claim 32

Stephens discloses characterised in that it comprises means of connection between the memories and the actuators of the stratum. **(Stephens,** p73, figure 3; 'memories and the actuators of the stratum' of applicant maps to the connections between the blocks of the fish architecture of Stephens.)

Claim 33

Stephens discloses characterised in that the connection is performed by virtue of generic calculation trees, common to all the memories and using the information of the memory. **(Stephens,** p73, figure 3; 'Generic calculating trees' of applicant maps to the archetype of the fish architecture of Stephens.)

Claim 34

Stephens discloses characterised in that it comprises means of linking between the memories for the creation of influences between the memories. **(Stephens,** p73, figure 3; 'Linking between the memories for the creation of influences between the memories' of applicant maps to the memory of 'perception' and the memory from 'motivation' leading into 'behavioural selection' of Stephens.)

Claim 35

Stephens discloses characterised in that it comprises a step of propagating influences between the memories by means of links. **(Stephens,** p73, figure 3; 'Links of applicant maps to the one ended arrows within the fish architecture of Stephens.)

Claim 36

Stephens discloses characterised in that it comprises optimisation of updates of influences limited to the influences which have undergone a change. **(Stephens,** p75, cl; Optimisation of applicant maps to 'This method has a complexity O(n) but can be optimized through the use of localization techniques of Stephens. 'Influences' of applicant maps to 'vision' of Stephens.)

Claim 37

Stephens discloses characterised in that it comprises a step of transmitting modified information to the rest of the decision model. **(Stephens,** p73, figure 3:

Transmitting the information of applicant maps to the function of the one ended arrows within the fish architecture of Stephens.)

Claim 38

Stephens discloses characterised in that it comprises a means of transmitting modified information by the creation of a virtual object. (Stephens, p73, figure 3; If the modified information can be transmitted then it is inherent that the virtual object exists.)

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.Patentability shall not be negatived by the manner in which the invention was made.

Claims 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stephens as applied to claims 1-7, 11, 12, 14, 15, 17, 19-21, 23, 24, 26-30, 32-38 above, in view of Niescier. (U. S. Patent 6266751, referred to as Niescier)

Claim 13

Stephens does not disclose expressly characterised in that it comprises means

of arranging the subprocesses in decreasing order of activation. Niescier discloses characterised in that it comprises means of arranging the subprocesses in decreasing order of activation. **(Niescier,** C3:25-37; 'arranging the subprocesses in decreasing order of activation' of applicant maps to **'A** control circuit assigns a first sub-plurality of the contiguous memory banks in increasing order from the lowest addressable end to a first memory map of the first processing agent, and assigns a second sub-plurality of the contiguous memory banks in decreasing order from the highest addressable end to a second memory map of the second processing agent' of Niescier.) Stephens and Niescier are analogous art because they form same field of endeavor of agents. At the time of the invention it would have been obvious to a person of ordinary skill in the art using dynamic memory for agent demands. The suggestionlmotivation for doing so would have been efficient computational costs of an agent. Therefore, it would have been obvious to combine Niescier with Stephens for the benefit of dynamic memory and ranking to obtain the invention as specified in claim 13.

Claim 16

Stephens does not disclose expressly characterised in that it does not comprise steps for dynamic memory allocation during the processing of the decision model. Niescier discloses characterised in that it does not comprise steps for dynamic memory allocation during the processing of the decision model. **(Niescier,** title; 'dynamic memory allocation during the processing of the decision model' of applicant maps to 'Continuously sliding window method and apparatus for sharing single-ported

memory banks between two agents' of Niescier.) Stephens and Niescier are analogous art because they form same field of endeavor of agents. At the time of the invention it would have been obvious to a person of ordinary skill in the art using dynamic memory for agent demands. The suggestion/motivation for doing so would have been efficient computational costs of an agent. Therefore, it would have been obvious to combine Niescier with Stephens for the benefit of dynamic memory and ranking to obtain the invention as specified in claim 16.

Response to Arguments

5. Applicant's arguments filed on August 5, 2011 for claims 1-42 have been fully considered but are not persuasive.

6. In reference to the Applicant's argument:

REMARKS/ARGUMENTS

Reconsideration and allowance of the above-identified application are respectfully requested. Independent claim 1 is amended herein. Claims 1-42 remain pending in the application.

The Examiner rejected claims 1-42 under 35 U.S.C. §101 as being directed to non-statutory subject matter. More specifically, the Examiner argues that the claimed method does not pass the "machine or transformation" test. While applicants dispute the Examiner's characterization that the claimed invention "needs to pass the machine-transformation test" in order to satisfy 35 U.S.C. §101, Applicants have nonetheless amended independent claim 1 in order to tie the method to a particular machine. As amended, claim 1 recites a memory means in which external variables are stored, as well as a processing means, actuators of the agent, and a subprocessing means. The amendment does not contain new matter, and is described in the specification, for

example, at page 8, lines 1 and line 14, which refer to the claimed subprocesses, and also page 8, lines 8-11, and page 13, lines 13-14, which refer to the claimed actuators. Further description of hardware for carrying out method steps according to an embodiment of the present invention is found in French patent application No. 2811449, discussed in the background of the application. A U.S. counterpart to that application is submitted herewith in an Information Disclosure Statement for consideration by the Examiner. Reconsideration and withdrawal of the rejection is respectfully requested in view of the amendments and arguments presented above.

Examiner's response:

In light of the amended claim and applicant's arguments, the Examiner withdraws the 35 U.S.C. §101 rejection.

7. In reference to the Applicant's argument:

The Examiner rejected claims 1-7, 1 I, 12, 14, 15, 17, 19-21, 23, 24, 26-30, 32- 38 under 35 U.S.C. §102(a) to Stephens. Applicants traverse the rejection since Stephens clearly fails to teach or suggest the elements of at least independent claim 1. As described in the present application, conventional decision models can determine actions of a virtual or physical agent, such as the modeled fish of Stephens, but suffer in that the decision model is not capable of choosing parameters for carrying out actions. Embodiments of the present invention advantageously include a decision- making means that determines the parameters of at least one action of the agent. The Examiner cites page 73, c. 1 of Stephens as teaching this feature, but the Examiner's reliance is misplaced. Stephens merely describes a conventional behavior model, such as "hunger" which may include parameters such as fish energy level, appetite, and digestion rate. However, the Stephens model is like the conventional systems described in the present application in that while there are parameters, there is not a decision-making means that itself chooses parameters used for carrying out actions. Stephens provides an example for the "hunger" model where altering parameters of a predator fish can make the predator fish appear greedy. However, Stephens assumes it is the modeler who changes the parameters, as opposed to the parameters being changed by a decision-making means of the virtual or physical agent, as in embodiments of the present invention. For at least this reason, Stephens fails to anticipate or render obvious at least claim 1 of the present invention. The remaining claims all depend from claim 1, and accordingly are allowable for at least the same reasons. Applicants respectfully request reconsideration and withdrawal of the rejection in view of the arguments made above.

Examiner's response:

Applicant that Stephens suffer in that it cannot choose parameters to carry out an action. The Examiner disagrees. On page 73 c1 of Stephens, it is stated that the behavior of hunting occurs when a predator is hungry. It does not hunt when it is not hungry. This maps to choosing which parameters due to either internal or exterior variables.

Conclusion

8.. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Claims 1-7, 11-17, 19-21, 23-24, 26-30, and 32-38 are rejected.

No art has been found for claims 8-10, 18, 22, 25, 31, 39-42.

Correspondence Information

10. Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner Peter Coughlan, whose telephone number is (571) 272-5990. The Examiner can be reached on Monday through Friday from 7:15 a.m. to 3:45 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor Ms. Kakali Chaki can be reached at (571) 272-3719. Any response to this office action should be mailed to:

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(571) 272-3150 (for formal communications intended for entry.)

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Peter Coughlan Art Unit 2122 9/16/2011	/Kakali Chaki/ Supervisory Patent Examiner, Art Unit 2122